

REMARKS

Summary of Amendments/Status of Claims

Claim 2 has been amended to incorporate the limitations of claim 18, which depended from claim 1.

Claim 1 has been canceled, as have claims 4-9 and 17, which depended directly or indirectly from claim 1. The claim 2 amendment necessitated the cancelation of claim 18. (Claims 3 and 13 were canceled in Applicant's March 17, 2008 reply to the Office's previous action.) The claim 2 amendment also necessitated the cancellation of claims 21, 27, 31, 32 and 39. Claims 35 and 36 were redundant over claims 33 and 34, respectively; consequently, claims 35 and 36 have also been canceled.

Claims 10-12 and 34 have been amended to make these method claims more clear and concise.

Claims 19, 20, 22-26, 28, 30, 37, 40 and 42 have each been amended to depend from claim 2. Claim 30, formerly dependent on claim 1, has been amended to depend from claim 28.

Claims 14-16, 29, 38 and 41 remain in their form as of Applicant's March 17, 2008 reply.

- **Claims 2, 10-12, 14-16, 19, 20, 22-26, 28-30, 33, 34, 37, 38 and 40-42** are pending the Examiner's further consideration in this RCE-accompanying reply.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 2, 4-6, 14-17, 19-21, 23-27, 37 and 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Gromnitskaya et al., "Mechanical Behavior and Microstructure of Nanodiamond-Based Composite Materials," *Journal of Materials Science Letters*, Vol. 21, 2002, pp. 1699-1702.

Claims 1, 4-6, 21, 27 and 39 have been canceled. Claim 2 has been amended to incorporate the limitations of claim 18, formerly dependent upon claim 1, such that claim 2 now sets forth a combination not previously presented in the pending claims. Claim 2 recites:

A ceramic composite comprising:
a phase having as its principal component, at a content of 40 to 98 wt.%, a pure carbon allotrope of 30 nm or less average crystal-grain size, said carbon being one selected from graphite, amorphous carbon, carbon black and fullerenes; and
a ceramic phase constituted by a ceramic that excludes pure carbon allotropes.

That is, diamond as a pure-carbon allotrope has been excluded from the subject matter of the now-pending claims. The 40 to 98 wt. % pure-carbon allotrope phase of Applicant's claimed ceramic composite is one selected from graphite, amorphous carbon, carbon black and fullerenes, which excludes diamond.

As noted in the Office-action letter, *Gromnitskaya et al.* "creates nanodiamond-SiC composites." Hence, since diamond is an essential constituent element of their composites for cutting-tool applications, and now that claim 2 is exclusive of diamond, *Gromnitskaya et al.* can no longer be alleged to anticipate claim 2.

Claim 2 no longer being anticipated by *Gromnitskaya et al.*, it follows that likewise claims 14-17, 19, 20, 23-26 and 37 no longer are, either.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 6, 17-28, 37 and 38: Keat '897

Claims 1, 6, 17-28, 37 and 38 were rejected as being unpatentable over U.S. Pat. No. 4,157,897 to Keat, in light of alleged abilities of one skilled in the art.

Claims 1, 6, 17, 18, 21 and 27 have been canceled. The rejection of claims 19, 20, 22-26, 28, 37 and 38 under this section will be addressed below.

Claims 7-9, 29 and 31-36: Keat '105

Claims 7-9, 29 and 31-36 were rejected as being unpatentable over U.S. Pat. No. 5,453,105, also to Keat, in light of alleged abilities of one skilled in the art.

Claims 7-9 and 31, 32, 35 and 36 have been canceled. The rejection of claims 29, 33 and 34 under this section will be addressed below.

Claims 7-12, 33 and 35: Gromnitskaya et al. (non-patent document)

Claims 7-12, 33 and 35 were rejected as being unpatentable over *Gromnitskaya et al.*, as cited above in a paraphrasing of the § 102 rejection, in light of alleged knowledge of one skilled in the art.

Claims 7-9 and 35 have been canceled. The rejection of claims 10-12 and 33 under this section will be addressed below.

Claims 1, 6, 16-17, 19-21, 23-27, 40 and 42: Brandrup-Wognsen et al. '177

Claims 1, 6, 16-17, 19-21, 23-27, 40 and 42 were rejected as being unpatentable over U.S. Pat. No. 5,723,177 to Brandrup-Wognsen et al., in light of alleged abilities of one skilled in the art.

Claims 1, 6, 17, 21 and 27 have been canceled. The rejection of claims 16, 19, 20, 23-26, 40 and 42 under this section will be addressed below.

Claims 40 and 41: Keat et al. '897 in view of Brandrup-Wognsen et al. '177

Claims 40 and 41 were rejected as being unpatentable over Keat '897, cited in the first § 103 rejection referred to above, in light of alleged abilities of one skilled in the art, and in view of U.S. Pat. No. 5,723,177 to Brandrup-Wognsen et al.

Together with the § 103 rejections listed out in the foregoing, this rejection of claims 40 and 41 will also now be addressed.

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Both of the cited U.S. patents to Keat constitute disclosures of composites for abrasive grinding applications in which, as is the case with *Gromnitskaya et al.*, diamond is an essential constituent element, as likewise noted in the Office-action letter.

The same is true of the U.S. patent to Brandrup-Wognsen et al.: The antiwear composites they disclose also require diamond as an essential constituent element.

Hence, the scope of the rejected claims that remain pending is outside that of the four references, both individually and in any combination, cited by the Office in making the presently addressed § 103 rejections—Keat '897 and '105, *Gromnitskaya et al.* and *Brandrup-Wognsen et al.* Their composites with diamond and c-BN constitute the superhard materials that for their abrasive-grinding, cutting-tool, and antiwear applications are requisite.

Moreover, claim 2 originally, and still now, limits the grain size of the carbon allotrope to being no larger than 30 nm, which limitation alone distinguishes claim 2 over the Keat patents.

It is respectfully submitted that for the foregoing reasons the patentability of the present application rests in claim 2 to begin with, and thus rests also in the remaining the claims rejected under this section of the Office action: claims 10-12, 16, 19, 20, 22-26, 28, 29, 33, 34, 37, 38 and 40-42, each of which either depends directly or indirectly from claim 2.

Conclusion

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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/James Judge/

James W. Judge
Registration No. 42,701

JUDGE PATENT ASSOCIATES
Dojima Building, 5th Floor
6-8 Nishitemma 2-Chome, Kita-ku
Osaka-shi 530-0047
JAPAN

Telephone: (305) 938-7119
Voicemail/Fax: (703) 997-4565